

## NOTES AND REVIEWS

*A Design for a Geostrophic Wind Scale.* By STEPHEN LICHTBLAU. The geostrophic wind scale is an important tool which can be used to considerable advantage in the construction of maps over ocean regions. The scale here presented, figure 1, is designed for four different latitudes, and of such dimensions that it may be applied directly to

corresponding to that observed. In this manner the positions of several isobars on either side of the ship may be extrapolated if necessary.

It is also possible to determine the movements of fronts at sea with the scale: For this purpose the scale is used between two adjacent isobars at and in the rear of the

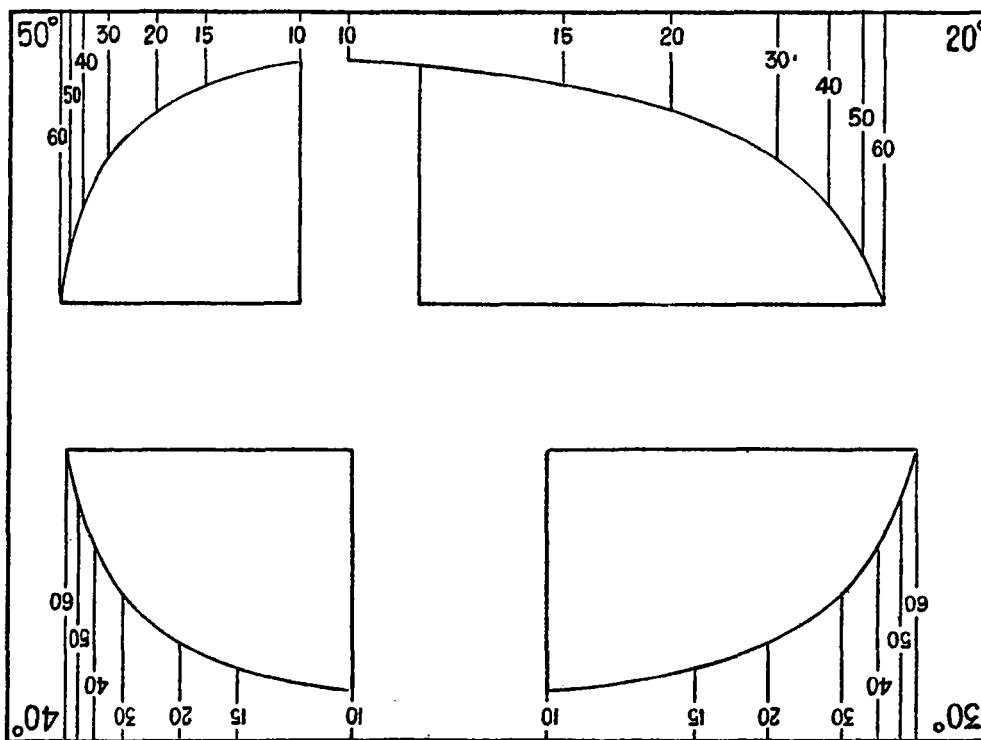


FIGURE 1.

the "Map A Pacific", the base map used at the San Francisco Weather Bureau office. The scale of this map is approximately  $1:1.5 \times 10^7$ . The wind scale may be made applicable to any other map by reducing or enlarging it in the ratio between the scale of "Map A Pacific" and that of the other map.

It should be remembered that the geostrophic wind scale applies only to rectilinear motion, and does not take into account the curvature of the trajectory of the air; but the error thus introduced is not important for most extra-tropical disturbances. The nomogram in Humphreys' *Physics of the Air* shows graphically the effect that the curvature of the path has on the gradient wind. The reduction of speed by frictional influences, which varies between 20 and 30 percent, is also neglected.

If this scale is to be used in daily synoptic analysis, it is advisable that it be transferred to a transparent material such as celluloid.

The scale will determine the correct distance between isobars, which is important in ocean regions where few reports are available: The right or the left edge of the scale (depending upon the latitude) is placed parallel to the wind, and through the position of the ship that sent the report. The distance between the ship and a point where the pressure is one-tenth inch higher or lower is then obtained from the curved scale, at the wind velocity

front. A line parallel to the ruled lines through one of the isobars (the edge of the scale being placed on the other isobar) will give the direction of the movement of

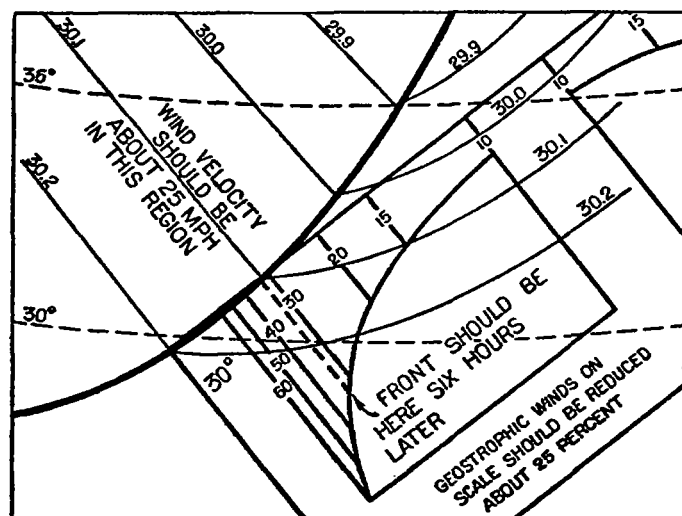


FIGURE 2.

the front, while the intersection of the line with the curve will give the magnitude of the movement for a 6-hour period; figure 2 explains the procedure.

A table is included for the use of anyone who desires to make a scale rather than to reproduce the one presented here; the tabular values are the abscissae of the geostrophic wind scale in miles.

| Speed           | Ordi-<br>nates | Latitude |     |     |     |     |
|-----------------|----------------|----------|-----|-----|-----|-----|
|                 |                | 20°      | 30° | 40° | 50° | 60° |
| <i>M. p. h.</i> | <i>Miles</i>   |          |     |     |     |     |
| 10              | 60             | 788      | 540 | 420 | 352 | 312 |
| 15              | 90             | 524      | 360 | 280 | 234 | 192 |
| 20              | 120            | 394      | 270 | 210 | 176 | 156 |
| 30              | 180            | 262      | 180 | 140 | 117 | 104 |
| 40              | 240            | 197      | 135 | 105 | 88  | 78  |
| 50              | 300            | 158      | 108 | 84  | 70  | 62  |
| 60              | 360            | 131      | 90  | 70  | 59  | 52  |

JEAN LUGEON. *Tables Crépusculaires*. Warsaw, 1934.

An important factor in many phenomena of the high atmosphere is the illumination of the air at upper levels by solar radiation. As an aid in the study of these phe-

nomena this volume of tables has been prepared. The tables give the vertical height above the surface of the earth of the lower limit of the illuminated region for different latitudes of the observer and different declinations and hour angles of the sun. This quantity is the distance from the surface of the earth to the point where the perpendicular to the surface is intersected by the solar rays that are just grazing the earth below the horizon. These tables cover 438 large pages. Incidentally, the times of sunrise and sunset can also be obtained from the data presented in the volume.

The tables have been computed from an accurate formula, in which the flattening of the earth and the azimuth of the sun have been taken into account. Refraction, however, has not been included, because it was thought preferable to give only definite geometric data, and not attempt to include such variable and uncertain physical factors as refraction. In a 38-page introduction, the formulae that were used are derived in detail.—*Edgar W. Woolard.*

## BIBLIOGRAPHY

[RICHMOND T. ZOCH, in Charge of Library]

By AMY D. PUTNAM

### RECENT ADDITIONS

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#### Arctic institute.

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